Oklahoma Current Farm Economics

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THE POTENTIAL FOR GRAIN SORGHUMS IN THE PLAINS

L. F. Miller

Past Trends

Grain sorghums have become a major enterprise in the central and southern plains. Total acreage, 90 percent of which is in the Plains, has expanded from 7.3 million acres in the five years 1946-50 to an average of 18.1 million in the two years 1957-58. The estimate for 1959 is about 16 million acres. Average yields per acre have also increased. Yields averaged 29.2 bushels per acre for the three years 1956-58 as compared with 19.2 bushels per acre in 1946-50.

This combination of expanded acreage and higher yields has brought sharp gains in total production. The average production was 142,531,000 bushels for the five years 1946-50, and 589,584,000 bushels for the two years 1957-58. This is an increase of 314 percent in about 10 years. For 1959 the estimated production is down to 556 million bushels, but this is still 297 percent above the 1946-50 average.

Most of the grain sorghum production has been utilized as feed. However, at times, exports have been an important outlet for grain sorghums, reaching a high of 75 million bushels in 1950 and again in 1958. Industrial uses have not been important from an overall standpoint, averaging only about 9 million bushels annually for the three years 1955-57. As is the case with other feed grains, there has been a sharp rise in the carryover of grain sorghums from a low of around 7.5 million bushels in 1953 to a carryover last year of about 310 million bushels. Based on present indications, the carryover next October 1 may be above 500 million bushels.

Future Prospects

In appraising the potential place of grain sorghums in the Great Plains it is necessary to assess the forces at work which will influence the utilization and supply of grain sorghums. In both these important respects, the outlook is relatively favorable.

Utilization

Among the important factors which appear to be favorable for an increased use of grain sorghums are:

(1) There is generally wider appreciation of the value of grain sorghums for livestock feed. Experimental results indicate that a pound of grain sorghum is equal to a pound of corn for feeding dairy cows and fattening lambs, and equal to 0.95 pounds of corn for fattening beef cattle and hogs.

(2) Prices of grain sorghums compared with corn continue to encourage the use of grain sorghums. In terms of feeding-value-equivalent based on corn prices, grain sorghums have been worth, on the average, $.23 a hundred pounds more than their market price for the three years 1956-58 for hogs and cattle.[1] For dairy cattle and lambs, the figure is $.34 cents per 100 pounds. Until this discount narrows appreciably, it will encourage greater use of grain sorghums.

(3) Upward trends in population and meat consumption tend to increase the relative advantage of feed grains in the Great Plains. Beef consumption in California, for example, is estimated to be 112 percent higher in 1965 than it was in 1947. This compares with an estimated increase of 72 percent for the same period for the U. S. as a whole.[2] The expanding livestock feeding operations in the West, and more recently in the Great Plains, to meet the rapidly expanding need for meat on the West Coast should continue to improve the competitive position of grain sorghums.

(4) The outlook for an expansion of livestock feeding in the Plains appears favorable. For example, the grain sorghum-hog ratio in Texas was more favorable than the corn-hog ratio in Iowa in eight out of the eleven years 1948-58.[3] One important limitation is the wide annual variation in grain sorghum production, which recently has been partially overcome by the enlarged storage facilities and by the expanded use of irrigation in the region.

While the relative position of utilization of grain sorghums appears good, there is the sobering reality that feed grains in general are in over-supply. Even with a population of well over 200 million by 1975,

[1]Schruben, L. W., *Digest of Papers Presented at Grain Sorghums Research Conference,* Amarillo, Texas, 1959, p. 36.

[2]Estimates made by G. G. Judge and T. D. Wallace in Oklahoma Agricultural Experiment Station Technical Bulletin TB-78, 1959.

[3]Schruben, L. W., *Ibid,* p. 31.

long range projections suggest that our needs for feed grains could be met by 14 percent fewer acres than were used in 1958 because of the higher yields per acre expected by that time.[4]

The Supply

The potential supply of grain sorghums compared with competing grains will be influenced by the relative progress in technical research to increase yields, increase the feeding value, and decrease the cost of handling. Any predictions would be questionable, but it does appear that advances in grain sorghum research will be equal to if not greater than the expected progress in competing grains. In this connection, the U.S.D.A. has estimated that grain sorghum yields by 1975 might be 55 percent higher than the 1951-53 average. This compares with an estimated increase of about 40 percent in per acre yields for wheat, and 45 percent increase for corn yields.[5]

Table 1.—Yields and Gross Receipts from Wheat and Milo in Selected Areas of Oklahoma and Kansas, 1939-58.

Year	Wheat Yields (Bu. per Acre)		Milo Yields (Bu. per Acre)		Gross Returns of Milo Compared with Wheat†	
	Oklahoma*	Kansas**	Oklahoma	Kansas	Oklahoma	Kansas
1939	7.3	1.9	6.2	3.8	— 1.50	+ .98
1940	5.6	2.8	6.4	7.9	— .16	+ 2.75
1941	9.3	14.5	12.2	16.2	+ .74	— .46
1942	13.9	20.4	13.0	12.5	— 3.01	—10.13
1943	8.9	12.4	6.6	11.9	— 4.82	— 3.34
1944	14.6	11.2	13.4	27.7	— 3.62	+13.44
1945	11.7	14.1	10.3	12.8	— 4.18	— 4.52
1946	12.0	13.4	7.8	12.3	— 8.51	— 4.71
1947	12.5	20.5	8.2	11.3	—12.49	—24.63
1948	9.8	12.2	17.0	19.5	+ 6.62	+ 6.20
1949	11.9	8.5	12.5	22.3	— 1.72	+13.48
1950	3.2	11.4	20.7	26.5	+17.77	+13.68
1951	5.4	5.6	13.3	25.6	+ 8.95	+24.51
1952	16.9	18.5	6.7	15.0	—21.27	—10.96
1953	5.6	4.6	8.8	13.5	+ 2.78	+ 9.93
1954	7.3	11.5	7.0	12.4	— 1.97	— 1.43
1955	1.2	13.3	9.0	7.1	+ 6.98	— 7.83
1956	5.4	10.0	6.7	10.5	+ .36	— 1.59
1957	7.7	4.4	10.8	18.9	+ 2.26	+12.64
1958	22.1	26.9	17.0	31.2	— 8.57	— .49
			20 year average difference		— 1.27	+ 1.38
			20 year average difference using actual prices		— 4.50	— 3.03

*Average for three northwestern Oklahoma counties of Ellis, Harper, and Woodward.
**Average for three Kansas counties of Rooks, Gove, and Ness.
†Gross returns computed on the basis of a pound of wheat priced at 110 percent of a pound of milo.

[4]Stewart, H. L., "Prospects for Adjustments in Production and Resource Use," *1958 Outlook Conference*, Washington, D. C., p. 22.

[5]Stewart, H. L., *Ibid.*, p. 16.

Gross Return: Returns from grain sorghums compare favorably with returns from wheat when both are priced as feed grains. The average gross return per acre for wheat for three Oklahoma counties for 20 years was $12.82 an acre, compared with $11.55 for grain sorghum. This was a difference of $1.27 in favor of wheat (Table 1). These calculations were based on average county yields and on feed grain prices for wheat 10 percent higher than grain sorghum on a per pound basis. On the basis of actual prices received, the average difference in gross returns was $4.50 an acre in favor of wheat for the 20-year period.

In three Kansas counties, the gross return based on a feeding value for wheat was actually $1.38 an acre higher for milo than it was for wheat. On the basis of actual prices, the average difference for the 20-year period was $3.03 per acre in favor of wheat (Table 2).[6] There were six years when the advantage in favor of milo averaged $14.61 per acre.

Cost of Production: One of the principal advantages of grain sorghums is that they utilize essentially the same machinery as wheat, but most of the use is at a different season of the year. Consequently costs of producing both wheat and grain sorghums are lowered because of a more complete utilization of machinery and labor. This situation is clear from the following data on monthly labor requirements in northwest Oklahoma for 100 acres of each crop:

Month	*Milo*	*Wheat*
	(hours)	(hours)
March	40	--
April	30	--
May	30	--
June	15	88
July	15	50
August	--	17
September	--	37
October	20	10
November	60	--

The estimated total cash costs, not considering fixed costs, were as follows for wheat and grain sorghum in northwest Oklahoma for 1957:

[6]For a 21-year comparison (1930-50) using yields at the Garden City and Colby, Kansas, Experiment Stations, and average annual prices at Kansas City, see R. J. Doll's *Grain Sorghum in the Great Plains Economy*, Federal Reserve Bank of Kansas City Bul., 1952, p. 38 and 42. At Garden City the average gross return in favor of milo was $6.03 per acre, and at Colby it was $1.13 per acre.

	Wheat	*Milo*
Pre-harvest machine and tractor operating costs	$1.36	$1.33
Seed	2.10	.48
Harvest operating costs	.88	1.44
Total	$4.34	$3.25

These data show that while harvesting costs are higher for milo, seed costs are appreciably higher for wheat. Therefore, the actual cash operating costs appear to be about a dollar per acre less for milo than they do for wheat. In addition, there is some "spreading" of fixed costs if both crops are grown.

Summary and Conclusions

Grain sorghum production continues to expand in the Great Plains, and in 1958 the total production in Kansas, Oklahoma, and Texas was equal to almost 90 percent of the total production of wheat in these three states. Such expansion appears to be based on sound physical and economic reasons. Demand is favored by the feeding value of grain sorghums for livestock, by its relatively lower price, and by the expanding population in the West.

On the production side, grain sorghums utilize the same machinery that is used for wheat, but generally at different seasons of the year, so that grain sorghums make for more effective, year-long utilization of machinery and labor on many Plains farms. While returns on grain sorghums cannot compete with wheat at present support prices, the returns are generally comparable in the production of both as livestock feed. Probable future scientific progress in breeding improved varieties suggests that grain sorghums should at least maintain, if not improve, their relative position in feed grain production. The principal disturbing feature in the 10 to 15 year outlook for grain sorghums is not peculiar to this enterprise. It stems from a production level for feed grains generally which appears to be higher than can be sold at satisfactory prices, even allowing for a rapidly expanding total population.

Small Grain Pasture in Oklahoma

Production and Utilization Alternatives

Odell L. Walker and James S. Plaxico

Winter and spring small grain pasture is an important contributor to the Oklahoma livestock industry. This high quality pasture is available during periods when other feeds are normally scarce and thus expensive. This article reports some research results of an analysis of small grain pasture utilization in Oklahoma.

The Utilization Problem

Year-to-year variation of small grain pasture production makes utilization planning extremely difficult. One can only determine whether a pasture year is good, average, or bad at the end of the year. However, before a manager knows what pasture production will be, he must decide how many acres to provide each animal pastured, how much feed reserve to carry, and how large the livestock enterprise will be.

Small grain utilization decisions depend not only on the amount of pasture expected but also on anticipated levels of cattle prices and expected margins between cattle purchase and selling prices. Feed reserve decisions depend partly on an anticipation of the number of rainy and snowy days during the winter when pasture cannot be grazed even if available. In addition, the producer must consider providing a feed reserve to be used in the event grazing is inadequate.

One way to analyze these decision problems is to consider the manager as playing a game of chance with "nature" as his opponent. Just as in other games of chance, each opposing player may have alternative strategies or moves that can be used during the course of the game. In the small grain pasture grazing game, it is assumed that the producer can stock his pastures heavily, moderately or lightly. For each stocking rate, he can carry a feed reserve adequate for either the worst weather conditions possible (maximum reserve) or the most favorable weather conditions possible (minimum reserve). Thus, the farmer has six strategies as follows: Heavy stocking—maximum hay reserve, heavy stocking—minimum hay reserve, moderate stocking—maximum hay reserve, moderate stocking—minimum hay reserve, light stocking—maximum hay reserve, and light stocking—minimum hay reserve.

For the game, "nature" is assumed to have control of pasture con-

ditions, weather conditions, cattle prices and hay prices. In the problem considered here, 18 possible alternatives are considered to be available for "nature." These include all combinations of three pasture conditions —above average, average, and below average; two winter weather conditions—rain and snow cause either 3 days or 31 days full feeding of hay during the grazing season; and three price conditions for cattle and hay—1947-48 prices (favorable for beef production), 1955-56 prices (unfavorable for beef production), and average price conditions of 1947-1957.

For each pair of courses of action, composed of one possible choice by "nature" and one choice by the producer, there is an outcome representing returns or losses for the producer. In the decision making process, the manager must estimate these outcomes to provide a basis for assessing the consequences of using his alternative actions under varying conditions imposed by "nature."

Planning Data

In 1957, seventy farmers in four Oklahoma areas—southwest, north central, panhandle, and east central—were interviewed to obtain data needed for analyzing the small grain pasture utilization problem. In this article, only the north central data are presented. These and similar data for the other areas are being prepared for publication in an Oklahoma Agricultural Experiment Station Processed Series.

Cow herds and stocker-feeder cattle grazed the small grain pasture in north central Oklahoma. Only the stocker-feeder alternative is considered in this article. Stocker-feeders for small grain grazing averaged 420 pounds going on pasture. Alfalfa hay, oat hay, or cottonseed hulls were usually fed with small grain pasture at the rate of 2 to 5 pounds per day. Rates of gain ranged from 1.81 to 1.17 pounds per day depending on the type of grazing year. In Table 1, pasture production in animal unit days of grazing per acre is given for above average, average, and below average years.

Statistical estimates of the pasture production distribution are included in Table 1. The statistical estimates were obtained by relating the pasture level to the amount and the distribution of rainfall for each year from long term weather records. Results show that, if future weather patterns are similar to the past, farmers can expect about 50 percent below average, 30 percent average, and 20 percent above average years in north central Oklahoma.

Table 1.—Small Grain Pasture Production and Distribution Data for Varying Weather Conditions in North Central Oklahoma.

	Above Averge Pasture	Average Pasture	Below Average Pasture
Average days grazing	122	110	91
Average days off pasture due to rain and snow	—	13	—
Average animal unit days of grazing per acre	30.6	22.2	10.7
Average steer daily gains	1.81	1.55	1.19
Statistical estimates of the years in 10 that wheat pasture falls in the three categories	1.8	2.7	5.5

The Payoffs

All farmer and nature alternatives assumed possible in the small grain pasture utilization game are shown in Table 2. Data from Table 1 have been utilized to compute returns per acre resulting from a manager's choice of a stocking rate-hay reserve strategy and from a specified weather-pasture-price condition. Use of per acre returns implies that pasture acreage is limited relative to funds for purchasing cattle and paying other expenses. That is, it is assumed that the producer desires to maximize returns per acre of pasture.

Payoffs in Table 2 are sales per acre minus feed, veterinary, marketing, hauling and steer purchase costs. For a given farmer strategy, differences in per acre returns result from: (a) differences in rates of gain in above average, average and below average pasture years; (b) differences in feed requirements when rainy and snowy days are relatively few rather than numerous or vice versa; and (c) different relationships between hay and cattle prices.

For any given strategy of nature, variations of per acre returns result from: (a) failure to utilize pasture fully in good pasture years, (b) heavy feed requirements due to overstocking, and (c) under supplies or over supplies of hay reserve causing mid-winter feed purchases or carryover of feed reserves into spring. Each farmer strategy interacts with a given state of nature in a different manner.

Alternative Solutions

The problem stated formally in Table 2 is undoubtably visualized informally by producers faced with making a decision. The task faced is to choose a course of action which will lead to the highest average

Table 2.—Returns Per Acre from Grazing Steers on Small Grain in North Central Oklahoma Under Varying Pasture-Weather-Price Conditions and with Different Stocking Rate and Feed Reserve Plans.

State of "Nature" (Nature's Alternatives)	Farmer Alternatives					
	Stock Heavily Feed Reserve		Stock Moderately Feed Reserve		Stock Lightly Feed Reserve	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
	(dollars per acre)					
Above Average Pasture						
3 days feeding, 1947-48 prices	22.15	23.15	16.15	16.76	7.99	8.09
31 days feeding, 1947-48 prices	20.24	19.97	14.77	14.46	7.33	6.98
3 days feeding, 1955-56 prices	9.68	10.23	7.07	7.41	3.52	3.58
31 days feeding, 1955-56 prices	7.66	7.69	5.61	5.57	2.82	2.69
3 days feeding, av. 1947-57 prices	13.12	14.42	9.65	10.44	4.92	5.04
31 days feeding, av. 1947-57 prices	11.28	11.40	8.31	8.26	4.27	3.98
Average Pasture						
3 days feeding, 1947-48 prices	16.84	16.30	13.96	14.57	6.94	7.03
31 days feeding, 1947-48 prices	14.92	13.12	12.58	12.27	6.27	5.92
3 days feeding, 1955-56 prices	4.84	4.77	5.33	5.67	2.68	2.73
31 days feeding, 1955-56 prices	2.82	2.23	3.86	3.82	1.97	1.84
3 days feeding, av. 1947-57 prices	8.09	7.99	7.61	8.40	3.94	4.05
31 days feeding, av. 1947-57 prices	6.25	4.98	6.27	6.22	3.29	3.00
Below Average Pasture						
3 days feeding, 1947-48 prices	9.56	6.91	7.81	6.35	4.06	5.56
31 days feeding, 1947-48 prices	7.61	3.73	6.43	4.04	4.81	4.45
3 days feeding, 1955-56 prices	-1.81	-2.73	- .40	- .90	1.51	1.57
31 days feeding, 1955-56 prices	-3.83	-5.27	-1.85	-2.74	.81	.68
3 days feeding, av. 1947-57 prices	1.17	- .83	1.77	.66	2.57	2.69
31 days feeding, av. 1947-57 prices	- .66	-3.85	.45	-1.52	1.93	1.64
Average returns	$8.38	7.46	6.96	6.65	3.98	3.97
Weighted average returns	6.50	5.74	5.70	5.39	3.58	3.78

returns consistent with some range of returns acceptable to the farmer. The following is an evaluation of some of the possible courses of action applicable to producers in different resource and goal situations.

Highest Average or Expected Value

One familiar way of selecting a course of action is to choose the one with the highest average return per acre. For example, the course of action having the highest simple average return in Table 2 is heavy stocking with a maximum feed reserve. This average is $8.38 per acre. However, the yearly returns may range from a loss of $3.83 to a gain of $22.15 per acre. Use of this simple average assumes that any strategy of nature may occur and that each may occur equally often.

If a manager is willing to assume that each state of nature will occur roughly as often as it has been observed in the past, he can use his knowledge of past occurrences to adjust the simple average to a weighted average (expected value). Since there were more below average than above average years, the weighted average was only $6.50 for the heavy stocking-maximum feed reserve strategy compared with $8.38 in the previous example. The range of possible outcomes, however, is still the same at -$3.83 to $22.15.

Would a manager be willing or financially able to follow a plan based on an average expectation? Obviously, he will only expect to realize the average return if he remains in business long enough to experience the full range of the possible states of "nature." The manager must be willing to assume in his planning that the implied distributions of weather, pasture, and prices are reasonable expectations for the future. If one year of loss or several years of losses in succession would put him out of business, he might prefer another course of action which would allow a lower level of loss in any given year but would necessarily result in a lower average return over time. He must be able to absorb the loss of $3.83 in some years by managing his financial affairs so that high returns in some years can be carried over. In addition, losses should not result in severe personal dissatisfaction.

The Minimax Plan

More conservative courses of action are open to producers not characterized by the conditions described above. The most conservative plan is to stock lightly and carry a maximum feed reserve. This alter-

native assures the manager of $.81 per acre every year.[1] In game theory terminology this is the minimax solution. That is, the player (farmer) follows a strategy which assures him a maximum income for the worst weather-pasture-price condition. Nature may do its worst but the farmer still gets $.81 per acre.

Returns per acre for this conservative strategy may range from $.81 to $7.99 per acre. This range of possible returns is much lower than the range of -$3.83 to $22.15 for the average strategy. The long run sacrifice of profits for security is approximately $2.92 per acre (i.e., the weighted average return of $3.58 for the conservative strategy as compared with $6.50 for the highest average return strategy).

Would any manager want to follow such a conservative strategy? What resource positions or psychological attitudes characterize such a farmer? He might have very severe capital restrictions and high fixed family and other expenses necessitating an income of at least $.81 per acre from pasture (in addition to other income) if he is to remain in business and maintain or improve his precarious position. Some individuals prefer enterprises offering the peace of mind of a low, though sure, return. The price of this security is lower average profits over time. As such individuals' positions improve, they may shift to less conservative plans.

Willingness or Ability to Take a Chance[2]

Courses of action may also be chosen according to the manager's willingness to take a chance. In the following, three levels of chance taking are considered and the appropriate strategies are presented. Assume the manager knows only that any one state of nature can occur in any year and has no idea of the probability distribution. If the manager would accept an unknown chance for a dollar as cheerfully as a sure return of $.68 to $1.00, he would be willing to stock heavily and carry a minimum feed reserve. In this case, he is gambling on the highest return possible. If a range of sure returns of $.28 to $.67 is equivalent to an unknown chance for $1.00, he would stock heavily and carry a maximum feed reserve. Movement to this strategy gains security and forfeits a chance for the highest possible return. The very conservative

[1]Such a statement assumes that data presented in Tables 1 and 2 are known with certainty. Obviously, these data are estimates and as such do have a probability distribution of their own.

[2]In this section, alternative strategies in Table 2 are matched to individual's willingness to take a chance by application of the Hurwicz decision criterion. Results presented are directly applicable for use in decision making. The Hurwicz decision criterion is explained more fully in R. D. Luce and H. Raiffa, *Games and Decisions: Introduction and Critical Survey* (New York, John Wiley and Sons, Inc., 1957), Chapter 13.

manager would stock lightly and carry a maximum feed reserve because for him a sure return of 0 to $.27 is equivalent to an unknown chance for $1.00.

Average Returns and Range of Returns

Other strategies in Table 2 might be chosen because they offer a preferred range of possible returns and average return. For example, the moderate stocking-maximum feed reserve strategy provides an opportunity to obtain an estimated weighted average return of $5.70 with an income range of -$1.85 to $16.15. This alternative has a substantially higher average than do either of the light stocking strategies. However, it subjects the manager to high potential losses. Each strategy could be arrayed as follows:

		Range	Weighted Average
(a)	Stock heavily—maximum feed reserve	-$3.83 to $22.15	$6.50
(b)	Stock heavily—minimum feed reserve	-$5.27 to $23.15	$5.74
(c)	Stock moderately—maximum feed reserve	-$1.85 to $16.15	$5.70
(d)	Stock moderately—minimum feed reserve	-$2.74 to $16.76	$5.39
(e)	Stock lightly—minimum feed reserve	$ .68 to $ 8.09	$3.78
(f)	Stock lightly—maximum feed reserve	$ .81 to $ 7.99	$3.58

Choice could be made from these alternatives to suit the manager's preference for high average per acre returns and a desirable range of returns.

Conclusions

Uncertainty of small grain pasture production, weather conditions, and hay-cattle prices requires careful managerial evaluation of utilization alternatives. Managers must assemble data on grazing conditions which they may experience and, if possible, estimate the probability of their occurrence. Table 1 of this article provides these data for north central Oklahoma. The problem formulation represented in Table 2, whether formally written or informally calculated and considered, is indispensable for thorough planning.

It is evident that different managers may rationally make very different pasture utilization plans because of differences in finances or preferences. The manager who can accept the consequences of "bad" years and recover from them in good years can stock heavily and carry

maximum feed reserves. He can expect to maximize returns over a long period of years from this choice. Another manager with financial stress and/or an aversion to losses in some years can follow the minimax plan of stocking lightly and carrying maximum feed reserves. Other alternatives requiring more chance taking or allowing a balance of chance taking and conservatism might be chosen by other managers who have carefully determined the suitability of the consequences for their own situation.

A Note on the Hog Situation

Kenneth B. Boggs

The nog price tumble in late June and early July this year may be a prelude to a general level of hog prices lower than in recent years. This price drop came on the heels of a 12-month downward trend and indicates a change in the seasonal price pattern for the summer months.

For 11 consecutive years there has been a shift toward earlier spring farrowings. This year 38.5 percent of the spring pig crop was farrowed during the months of December, January, and February. This is double the percentage during these same months 10 years ago and up sharply compared with the 1948-57 average of 24.3 percent. The combined effect of the change in the spring farrowing pattern together with the larger pig crops contributed to the sharp price drop in July this year. Moreover, cold storage stocks of pork were larger this past summer than a year earlier.

The 1958 fall pig crop was 17 percent larger than in 1957 and the 1959 spring pig crop was 12 percent larger than the spring of 1958. While most of the fall pig crop is usually marketed by late August, the bulk of the 1959 spring pig crop is yet to be marketed this fall. September and October prices are likely to continue downward, reaching a low in late October or early November this year. However, hog prices are not expected to fall as low as the fall of 1955. Price fluctuations during these months probably will be held to a narrower range than in prior years.

Hog production in the United States appears to be moving above the 100 million mark in 1959. This has occurred in only three years—1942, 1943, and 1951. With the 1959 spring pig crop of 58.5 million pigs and an estimated 8 percent more sows to farrow this fall than last, the 1959 pig crop could be as large as 104.5 million pigs.

In relation to population, this year's pig crops are not of record size even for peace time. However, they are fairly large. With corn prices declining over the last several years and hog prices unusually high last year, lower hog prices have been inevitable. Even with decreasing hog prices, the relatively lower corn and other feed prices may still make hog production relatively attractive to many farmers. It would appear that hogs can be produced cheaper at current corn prices than was possible a few years ago.

The hog-corn price ratio of this summer has been close to normal and in August was about 12.4. It was somewhat lower in Oklahoma; but for Oklahoma farmers, grain sorghum prices are relatively more attractive than corn. With the hog-feed ratios about average, a serious question is whether these ratios will continue to encourage an expansion of hog production throughout 1960. The profit margin appears to be shrinking but this could be even more serious if it should be extended for the next 12 to 18 months.

Oklahoma Agricultural Commodity Price Changes

Prices received by Oklahoma farmers for agricultural commodities declined from May to June but held relatively steady from June through August. The index of prices received by Oklahoma farmers on August 15 was 266 percent of the 1910-14 average. This was down 4 points from August a year ago.

The index of prices paid by U. S. farmers, at 297 percent of the 1910-14 average, declined slightly during the summer months. The decrease was only 2 points—one point from May to June and one point from July to August. However, as compared with a year ago the prices paid index was 4 points higher. This resulted in a decrease in the index of purchasing power of Oklahoma commodities from 92 in August 1958 to 90 in August 1959.

Crop prices declined seasonally from May to June then increased through August. The changes were similar for most crops except grain sorghums, corn, and hay. From June to August, grain sorghum prices dropped about 10 percent while corn and hay prices remained about the same.

Livestock and livestock product prices declined each month from May through August. These changes reflected the sharply lower meat animal prices since both the dairy products group and the poultry and poultry products group registered higher prices.

Of the various product-feed price ratios listed in Table 4, only the hog-corn price ratio declined significantly during the summer. In August all the price ratios were below the levels of a year earlier except the turkey-feed price ratio, which was about the same.

Prices received by Oklahoma farmers are likely to decrease further in the next three months and to remain below the levels of last year. Seasonal declines are expected for hogs, cattle, cotton, corn, and grain sorghums. Partially offsetting these declines, seasonal increases are expected for wheat, oats, barley, hay, and poultry products. Wholesale milk prices generally increase at this season of the year but the present supply-demand adjustment factor in the Federal Order for the Oklahoma Metropolitan Marketing Area may curtail most of the usual increase unless the factor is adjusted.

Table 1.—Monthly and Season Average[1] Prices Received by Farmers for Oklahoma Farm Products. (Dollars)

		Wheat	Corn	Oats	Barley	Rye	Grain Sorghum	All hay	Alfalfa hay	Wild hay	Cotton-lint	Cotton-seed	Soy-beans	Pea-nuts
1957		1.93	1.24	.65	.80	.97	1.64*	19.30	23.62*	16.22*	.227	49.70	2.01	.102
1958**		1.75	1.15	.56	.77	.89	1.70	15.00	18.69	12.97	.310	41.40	1.80	.105
1958	Aug.	1.66	1.24	.56	.76	.88	1.80	14.60	17.60	12.00	.320	-- --	2.00	---
	Sept.	1.75	1.08	.60	.78	.96	1.65	14.40	17.30	11.50	.322	42.00	1.86	.105
	Oct.	1.79	1.07	.60	.80	.92	1.56	15.00	17.70	12.80	.311	41.00	1.77	.106
	Nov.	1.81	1.06	.61	.85	.96	1.62	15.20	18.40	12.80	.305	42.00	1.78	.103
	Dec.	1.78	1.11	.62	.86	.97	1.68	16.80	19.90	14.10	.268	42.00	1.88	.105
1959	Jan.	1.80	1.12	.64	.89	.98	1.72	17.10	20.40	14.00	.252	41.00	1.95	.103
	Feb.	1.84	1.12	.64	.89	.98	1.78	16.40	19.60	13.30	.264	42.00	1.95	.105
	Mar.	1.84	1.13	.63	.88	.97	1.80	16.30	19.80	12.80	.256	42.00	1.95	.105
	Apr.	1.87	1.16	.65	.88	.95	1.86	16.80	20.40	13.20	.296	-- --	2.00	.102
	May	1.82	1.18	.64	.83	.90	1.90	16.40	20.20	12.70	.270	-- --	2.00	---
	June	1.69	1.20	.55	.69	.88	1.92	15.60	19.00	12.30	.270	-- --	1.95	---
	July	1.71	1.20	.60	.74	.89	1.89	15.70	19.50	12.00	.290	-- --	1.90	---
	Aug.	1.73	1.20	.64	.77	.87	1.69	15.60	19.60	11.50	.300	41.00	1.89	---

		Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butter-fat	All chickens	Commercial broilers	Eggs	Turkeys	Wool	Alfalfa seed	Sweet Potatoes
1957		15.90	17.90	6.60	19.60*	17.90	4.59*	.53	.163	.183	.293	.221	.45	21.20*	2 85
1958**		21.50	25.50	7.80	21.00	19.60	4.65	.52	.166	.179	.328	.222	.28	19.00	2.42
1958	Aug.	21.70	25.60*	7.50	21.00	21.30	4.50*	.52*	.158*	170	.300	.210	.29	19.50	2.50
	Sept.	22.10	26.60*	7.50*	20.30*	19.90*	4.70*	.53*	.150*	.160*	.345	.220	.28*	18.70	2.50
	Oct.	21.80	26.10*	7.40	20.30*	18.30	4.75*	.53*	.144*	.155*	.348	.220	.30*	19.10	2.20
	Nov.	21.80*	26.80*	7.40	20.00	18.30*	4.80*	.53*	.146	.155*	.357	.220	.29	19.40	2.35
	Dec.	22.70	27.50	7.20*	18.60*	17.80	4.90*	.53*	.139	.150*	.373	.230	.29*	19.00	2.45
1959	Jan.	22.70	27.50	7.10	17.40	16.60	4.80*	.51	.154	.165	.363	.230	.28	20.00	2.55
	Feb.	23.10	28.50	7.20	17.40	15.80	4.70	.52	.141	.160	.320	.22	.28	20.00	2.55
	Mar.	23.20	28.30	7.50	18.30	15.30	4.65	.52	.133	.160	.288	.22	.27	19.50	2.55
	Apr.	24.00	29.30	7.50	19.60	15.60	4.35	.52	.133	.150	.227	.22	.30	20.00	---
	May	24.10	29.30	7.20	22.00	15.30	4.10**	.52	.136	.150	.205	.21	.33	19.50	---
	June	23.80	29.30	7.00	21.40	15.30	4.15	.52	.130	.145	.205	.20	.36	-- --	---
	July	23.10	29.50	7.50	20.50	14.00	4.30	.52	.141	.155	.241	.21	.37	-- --	---
	Aug.	22.60	28.00	6.50	19.20	13.70	4.40**	.53	.136	.150	.253	.21	.37	19.70	2.60

SOURCE: *Prices Received by Farmers*, Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, Monthly Releases or *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C.

[1] Annual prices for crops are season average prices for the crop year weighted by marketings. Annual prices for livestock and products are season average prices for the calendar year weighted by marketings.

* Revised ** Preliminary *** 9 months average

Table 2.—Index Numbers of Prices Received by Farmers for Oklahoma Farm Products.[1]
(Percent of 1910-14 Average)

		Wheat	Corn	Oats	Barley	Rye	Grain sorghums	All Hay	Cotton-lint	Cotton-seed	Sweet Potatoes
1957		227	205	166	150	123	155	261	244	286	235***
1958		215	180	135	128	109	143	183	228*	251	229
1958	Aug.	193	191	125	127	102	150	166	283*	* *	203
	Sept.	203	166	134	130	112	137	163	284	215	203
	Oct.	208	165	134	134	107	130	170	275	210	179
	Nov.	210	163	136	142	112	135	172	269	215	191
	Dec.	206	171	139	144	113	140	190	237	215	199
1959	Jan.	209	172	143	149	114	143	194	223	210	207
	Feb.	213	172	143	149	114	148	186	233*	215	207
	Mar.	213	174	141	147	113	150	185	226	215	215
	Apr.	217	166	145	147	110	155	190	261	215	215
	May	211	182	143	139	105	158	186	239	215	---
	June	196	185	123	115	102	160	177	239	215	---
	July	198	185	134	124	103	157	178	256	215	---
	Aug.	201	185	143	129	101	140	177	265	210	211

		Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butterfat	All chickens	Eggs	Wool
1957		328	297	147*	336	256	239*	225*	173	171	261
1958		445*	423	169*	358	281*	242*	223*	176*	185	182
1958	Aug.	449	429*	162	361	303	234*	222*	168*	169	169
	Sept.	458	446*	162*	349*	283*	244*	226*	160*	194	163*
	Oct.	451	437*	160	349*	260	247*	226*	153*	196	175*
	Nov.	451	449*	160	344*	260*	249*	226*	155	201	169
	Dec.	470	461	156	320*	253	254*	226*	148*	210	169*
1959	Jan.	470	461	154	299	236	249*	218	164	204	163
	Feb.	478	477	156	299	224	244	222	150	180	163
	Mar.	480	474	162	315	217	241	222	151	162	157
	Apr.	497	491	162	337	222	226	222	142	128	175
	May	499	491	156	379	217	213*	222	145	115	192
	June	493	491	152	368	217	215	222	138	115	210
	July	478	494	162	353	199	223	222	150	135	215
	Aug.	468	469	141	330	195	228	226	145	144	215

SOURCE: Annual data are averages of months for calendar years and are compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] For the index of purchasing power of a unit of an individual commodity in terms of commodities used in farm production and family living, interest, taxes and wage rates, divide the index of price received by Oklahoma farmers (in this table) by the index prices paid by United States farmers in Table 4 for the same month and multiply by 100.

* Revised ** Data not available *** 9 months average

Table 3.—Price Indexes of Groups of Oklahoma Farm Products.
(Percent of 1910-14 Average)

		All farm products	All crops	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. Prod.	Meat animals	Dairy products	Poultry and poultry prod.
1957		251	237	182	215	247	306	267*	305	255*	175
1958		271*	220*	159	172	230*	283	327*	401*	256*	187*
1958	Aug.	270*	217*	164	170	280*	292	327	409*	251*	172
	Sept.	276	222	152	160	275	273	335*	413*	259*	190*
	Oct.	274	223	148	161	266	272	329	403	260*	190*
	Nov.	275*	224	150	163	262	269	331*	405*	260*	194
	Dec.	275*	216	156	172	233	273	340*	417*	264*	199*
1959	Jan.	273	215	159	176	220	267	336*	413	259*	199
	Feb.	275	220	160	174	230	273	335	418	257	177
	Mar.	273	219	161	174	224	273	332	418	255	164
	Apr.	278	228	166	179	255	268	333	432	246	136
	May	273	220	167	179	235	268	330	432	239	126
	June	266	209	164	174	235	267	328	428	239	125
	July	267	215	166	175	250	267	324	416	242	143
	Aug.	266	218	162	172	258	265	320	405	248	148

Purchasing Power Indexes of Groups of Oklahoma Farm Products[1]
(Percent of 1910-14 Average)

		All farm products	All crops	Food grains	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. prod.	Meat animals	Dairy products	Pltry. and pltry. prod.
1957		88	83	79	64*	75*	86	107*	93	106	89*	61*
1958		92	75	73	54	59	78*	96	111	137	87*	64*
1958	Aug.	92*	74*	66	56	58	[illegible]	100	112	140	86*	59
	Sept.	94	76	69	52	54	94	93	114	140	88*	65
	Oct.	93	76	71	50	55	90	93	112	137	88*	65
	Nov.	94*	76	71	51	55	89	91	113*	138*	88*	66
	Dec.	93	73	70	53	58	79	93	115*	141	89*	67*
1959	Jan.	92	72	70	53	59	74	90	113*	139	87*	67
	Feb.	93	74	72	54	59	77	92	113	141	87	60
	Mar.	92	73	71	54	58	75	92	111	140	86	55
	Apr.	93	76	73	56	60	85	90	111	144	82	45
	May	91	74	71	56	60	79	90	110	144	79*	42
	June	89	70	66	55	58	79	90	110	144	80	42
	July	90	72	66	56	59	84	90	109	140	81	48
	Aug.	90	73	67	55	58	87	89	107	136	84	50

SOURCE: Compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] The ratio of prices received by farmers to prices paid by farmers for commodities used in farm living and production, interest, taxes and wage rates. For individual commodities, see footnote 1 of Table 2.

* Revised

Table 4.—Index Numbers in the United States, Index of Demand Deposits in Oklahoma, and Oklahoma Price Ratios.

		United States index numbers of:					Oklahoma price ratios[4]			
		Prices received by farmers (1910-14=100)	Prices paid by farmers (1910-14=100)	Wholesale prices (1910-14=100)	Industrial manufacturing payrolls[1] (1947-49=100)	Index of demand deposits in Oklahoma[2,3] (1923-25=100)	Hog corn	Egg feed	Turkey feed	Milk feed
1954		246	277	247	137.7	289.3	15.15	8.6	7.4	1.479
1955		232	276	248	152.8*	291.3	11.43	9.5	7.4	1.622*
1956		230	278	256	161.3	297.4	10.35	9.7	7.2	1.695*
1957		235	286	264	162.7	290.9	13.55	9.2	6.8	1.757*
1958		250	293	268	148.8	313.0	16.87	10.2	6.9	1.968*
1958	Aug.	248	293	267	150.0	319.6	17.18	9.3	6.5	1.924*
	Sept.	254	294	267	155.7	321.6	18.24	10.8	6.9	2.056*
	Oct.	249	294	267	152.5	329.1	17.10	11.0	7.0	2.097*
	Nov.	247	294	267	158.4*	336.0	16.98	11.4	7.0	2.078*
	Dec.	244	295	267	160.4*	339.2	16.04	11.6	7.1	1.979
1959	Jan.	244	298	270	158.2	341.6	14.82	11.1	7.1	1.879
	Feb.	243	297	267	160.4	335.7	14.11	9.8	6.7	1.854
	Mar.	244	298	267	165.1	330.0	13.54	8.9	6.8	1.856
	Apr.	244	299	270	166.5	339.2	13.45	6.9	6.6	1.696
	May	245	299	270	169.6	329.7	12.97	6.2	6.4	1.619*
	June	242	298	267	172.8	332.9	12.75	6.4	6.3	1.748
	July	240	298	267	---	341.5	11.67	7.6	6.6	1.810
	Aug.	239	297	267	---	---	11.42	8.1	6.6	1.828

SOURCE: Indexes of U. S. prices received and prices paid by farmers and indexes of U. S. wholesale prices, from *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C. Indexes of demand deposits in Oklahoma, calculated by Dept. Agri. Econ., Okla. Agri. Exp. Sta. from data furnished by Federal Reserve Board, Washington, D. C. Indexes of industrial manufacturing payrolls, from U. S. Department of Labor, Bureau of Labor Statistics, Washington, D. C.

[1] Unadjusted for seasonal variation.

[2] Demand deposits of Oklahoma member banks of the Federal Reserve System located in places under 15,000 population.

[3] Index numbers based on net demand deposits prior to 1936 and upon gross demand deposits since that date. For a discussion of this index see CURRENT FARM ECONOMICS, Oklahoma Agricultural Experiment Station Series 49, Vol. 13, Nos. 1 and 2. Feb.-Apr., 1940. p. 41.

[4] The number of bushels of corn or pounds of feed which one unit of the commodity (100 pounds of hogs, one dozen eggs, one pound of turkeys or milk) will purchase. Prices used are the official A.M.S. estimates of prices received by Oklahoma farmers except for commercial feeds or ingredients which are official A.M.S. estimates of prices paid by Oklahoma farmers. These ratios are computed on the basis of fixed rations and are not directly comparable with ratios computed from other rations. The composition of each ration used is available upon request.

* Revised.

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